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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,518	10/10/2003	Yukio Shakuda	KAW 104	2952
23995	7590	08/09/2005	EXAMINER	
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005			LOUIE, WAI SING	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/682,518	Applicant(s) SHAKUDA ET AL.	
	Examiner Wai-Sing Louie	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3 is/are rejected.
- 7) ☒ Claim(s) 2 and 4-8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/03, 5/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nido et al. (US 6,635,905) in view of Wang (US 6,469,324).

With regard to claim 1, Nido et al. disclose a gallium nitride based compound semiconductor light-emitting device (col. 5, line 33 to col. 50, line 15 and fig. 7), comprising:

- an n-GaN semiconductor substrate 1 (col. 36, line 42 and fig. 7);
- an InGaN/InGaN MQW light-emitting layer 4 (col. 36, lines 47-52) forming portion provided on the semiconductor substrate 1, in which an active layer made of a compound semiconductor is sandwiched between an n-AlGaN first clad layer 2 and a p-AlGaN second clad layer 7 made of compound semiconductor having bandgap greater than that of the active layer 4, respectively and having a different conductivity type each other (col. 36, lines 41-56 and fig. 7), where the second clad layer 7 is made of a compound semiconductor having a refractive index greater than that of the first clad layer 2 provided on the substrate 1 (col. 25, lines 56-62).

- Nido et al. do not disclose a window layer provided above the second clad layer 7.

However, Wang discloses a window layer 14 formed on top of the second clad layer 124 (Wang col. 5, lines 1-2 and fig. 7). Wang teaches the window layer allows the emitted light to escape from the top with reduced total internal reflection loss (Wang col. 1, lines 35-39). Therefore, it would have been obvious to one of ordinary skill in the art to modify Nido's device with the teaching of Wang to provide a window layer formed on top of the second clad layer in order to allow the emitted light to escape from the top with reduced total internal reflection loss.

With regard to claim 3, Nido et al. modified by Wang do not disclose the refractive index of the second clad layer is greater than the refractive index of the first clad layer by 6 to 4%. Since the applicant has not established the criticality of the refractive index stated and since these indices are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device. Where patentability is said to be based upon particular chosen dimension or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Allowable Subject Matter

Claims 2 and 4-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2814

The following is an examiner's statement of reasons for allowance:

The prior art of record does not disclose or suggest either in singularly or in combination the following limitations and other elements in the claims:

References Nido et al. and Wang do not disclose:

- the window layer having a refractive index greater than that of the second clad layer.
- the first clad layer is made of $\text{In}_{0.49}(\text{Ga}_{1-s}\text{Al}_s)_{0.51}\text{P}$ ($0.6 \leq s \leq 1$) and the second clad layer is made of $\text{In}_{0.49}(\text{Ga}_{1-y}\text{Al}_y)_{0.51}\text{P}$ ($0.4 \leq y \leq 0.75$, $y < s$).
- the window layer is made of $\text{Al}_v\text{Ga}_{1-v}\text{As}$ ($0.6 \leq v \leq 0.85$).
- the first clad layer is made of $\text{Al}_z\text{Ga}_{1-z}\text{As}$ ($0.6 \leq z \leq 0.9$) and the second clad layer is made of $\text{Al}_u\text{Ga}_{1-u}\text{As}$ ($0.4 \leq u \leq 0.85$, $u < z$).
- the window layer is made of $\text{Al}_w\text{Ga}_{1-w}\text{As}$ ($0.4 \leq w \leq 0.7$, $w < u$).
- the window layer is formed on the semiconductor substrate side of the first clad layer, where the window layer having a refractive index smaller than that of the first clad layer.

Therefore, the above references do not disclose the claimed invention of present application and claims 2 and 4-8 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wsl
August 4, 2005.

